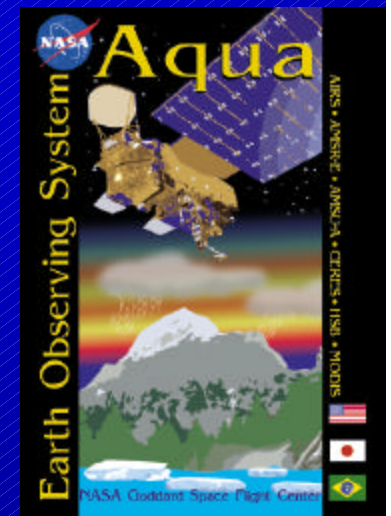


First Light from the Other Instruments: CERES, MODIS, and AMSR-E



Claire L. Parkinson
Aqua Project Scientist

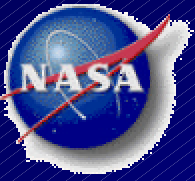


AIRS Science Team Meeting
World Weather Building, Camp Springs, MD
September 18, 2002

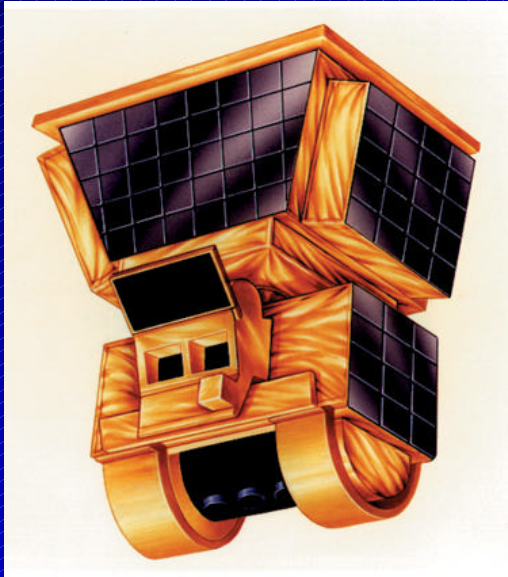


Timeline of On-Orbit Highlights

- May 12 -- First AMSU science data.
- May 14 -- First HSB science data.
- May 15-23 -- Spin-up of the AMSR-E rotation rate from 4 revolutions per minute (rpm) to 40 rpm.
- May 24 -- First AMSR-E science data.
- May 26 -- First AIRS visible/near-infrared science data.
- June 1 -- Adjustment to the AMSR-E Automatic Gain Control.
- June 12 -- First AIRS infrared science data.
- June 17 -- Final ascent burn to 705 km operational altitude.
- June 18 -- First CERES science data.
- June 24 -- First MODIS science data.
- July 12 -- Direct broadcast turned on.
- September 1 -- Conclusion of the 120-day checkout period; transfer from Aqua Project to Mission Operations (ESMO).



Clouds and the Earth's Radiant Energy System (CERES; two copies)

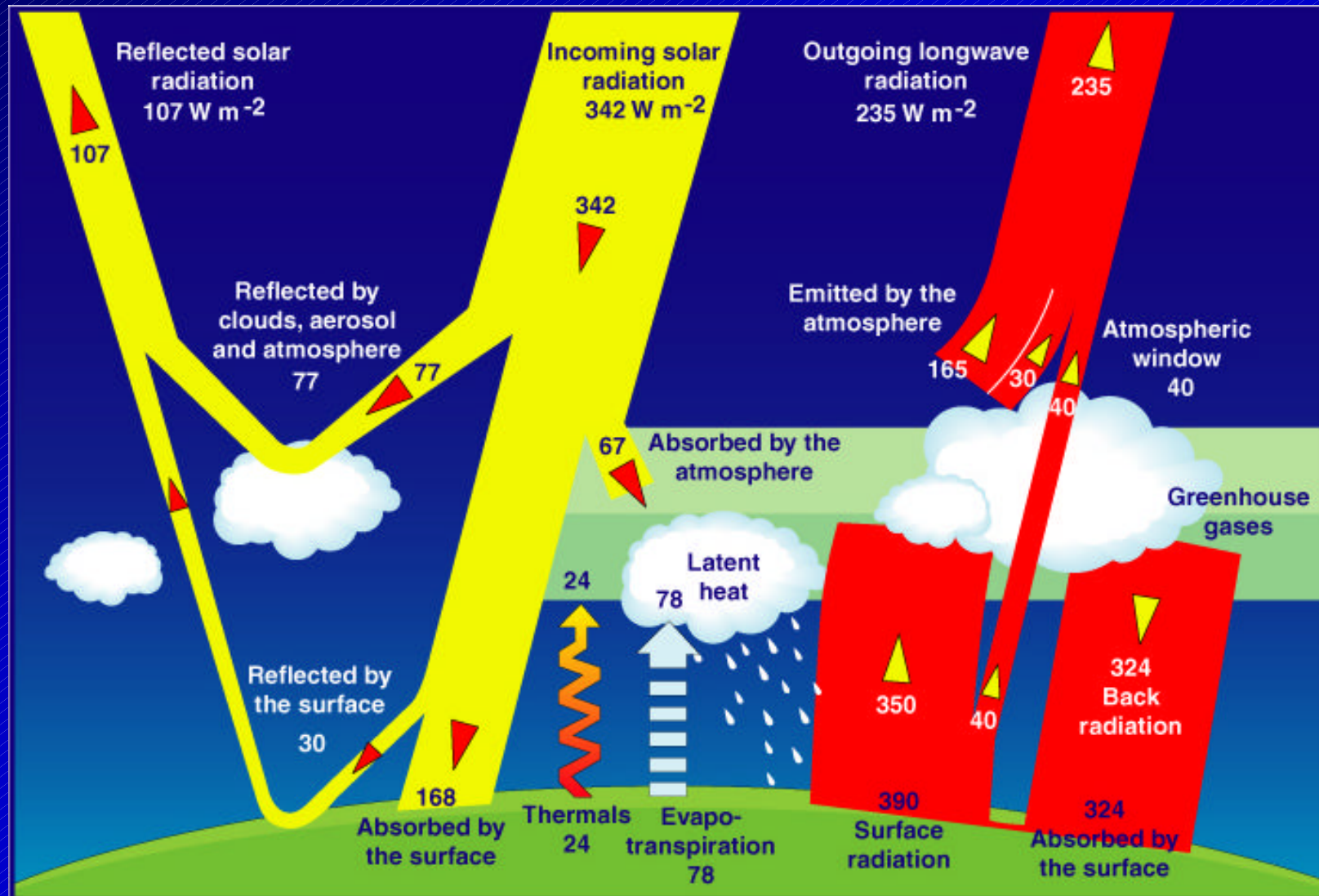


Schematic view

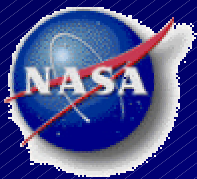
Actual CERES instruments,
undergoing inspection



The Earth's Radiation Budget

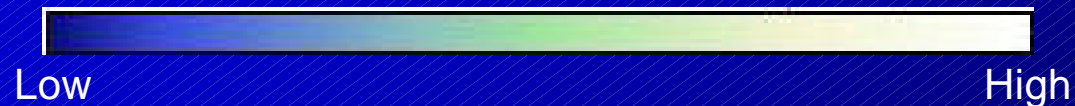
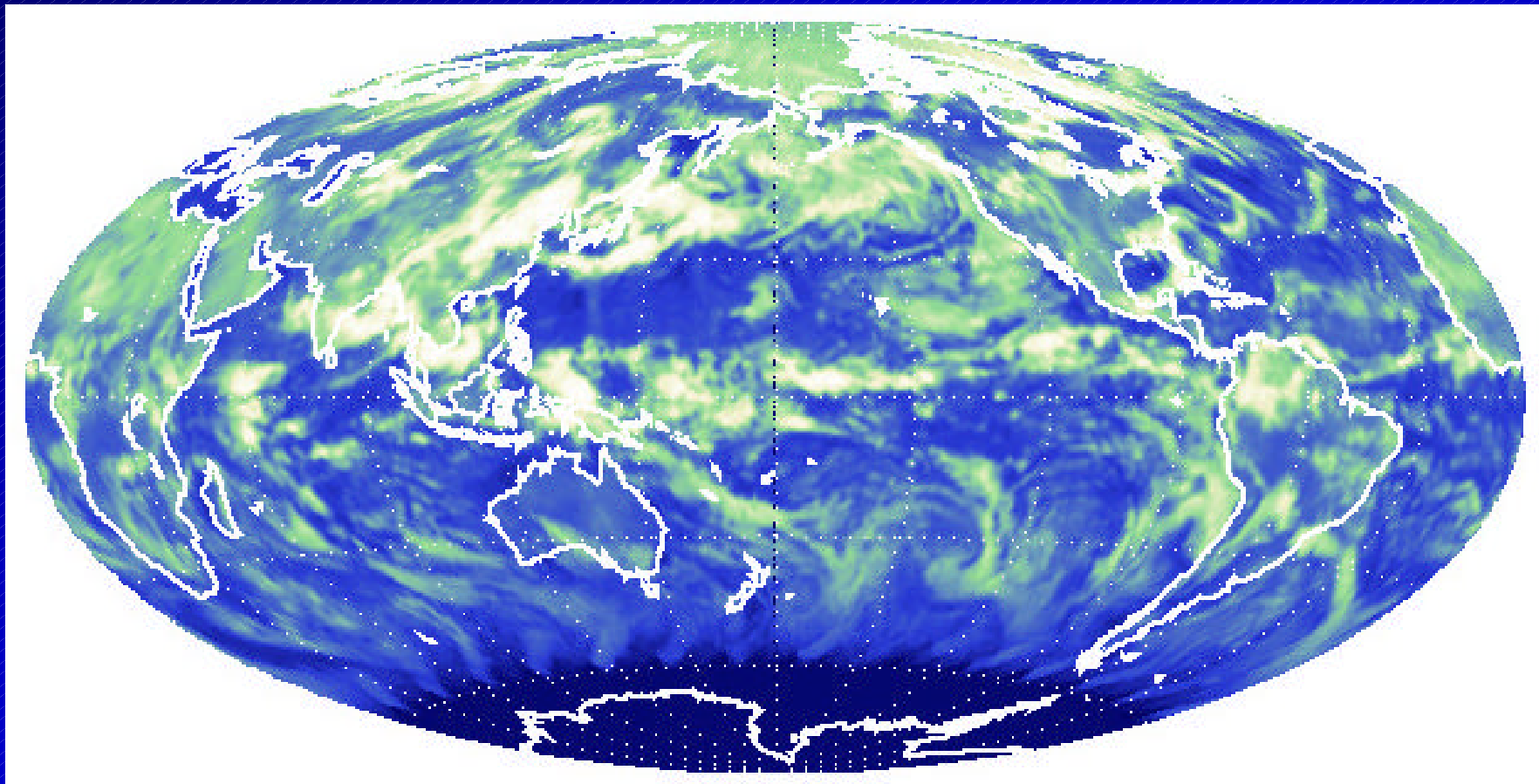


(adapted from Kiehl and Trenberth, 1997, by the CERES Science Team)

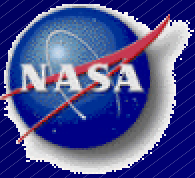


CERES First Light Image

Reflected Shortwave Flux, June 22, 2002

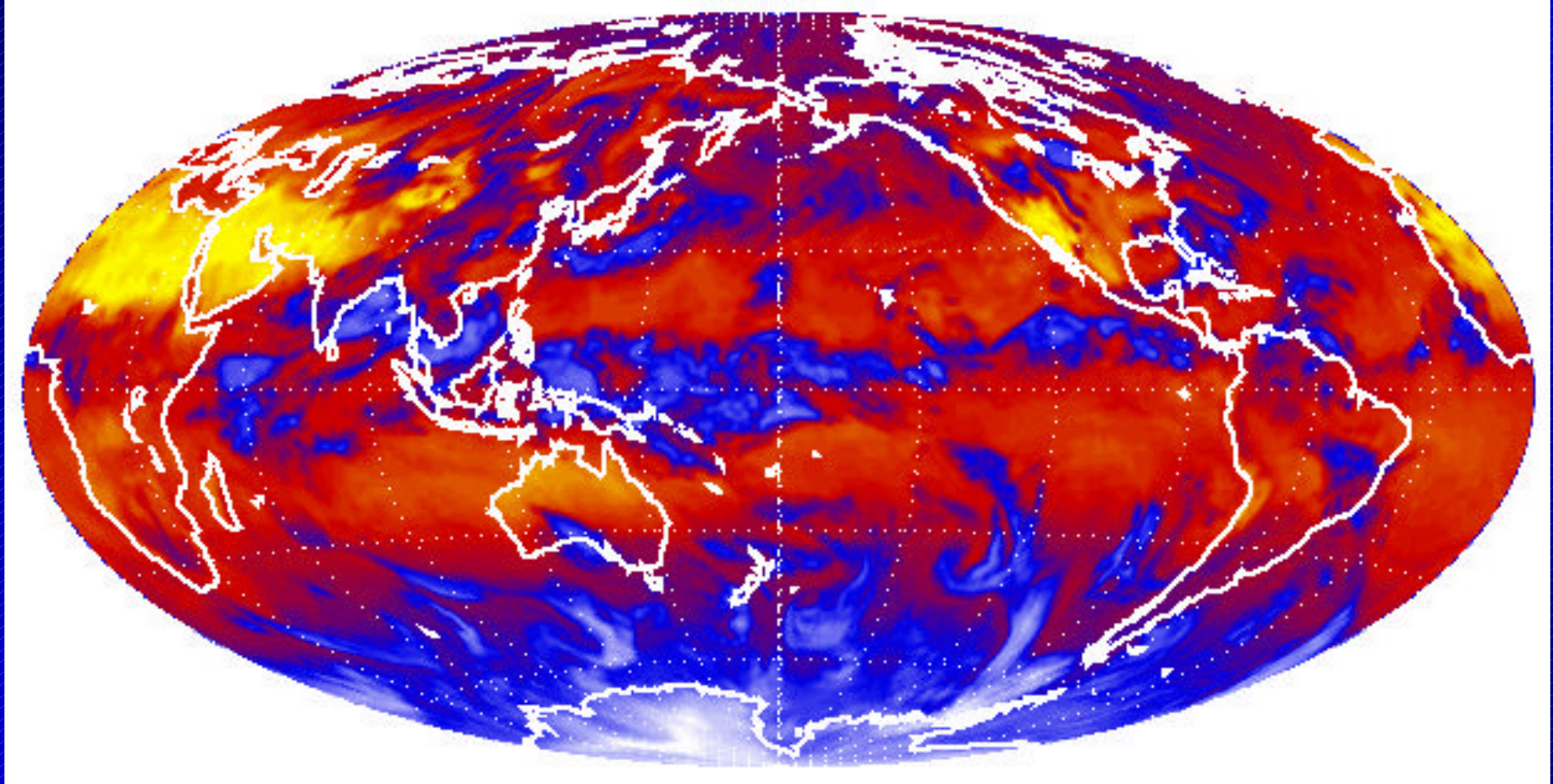


(image courtesy of the CERES Science Team)

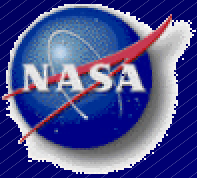


CERES First Light Image

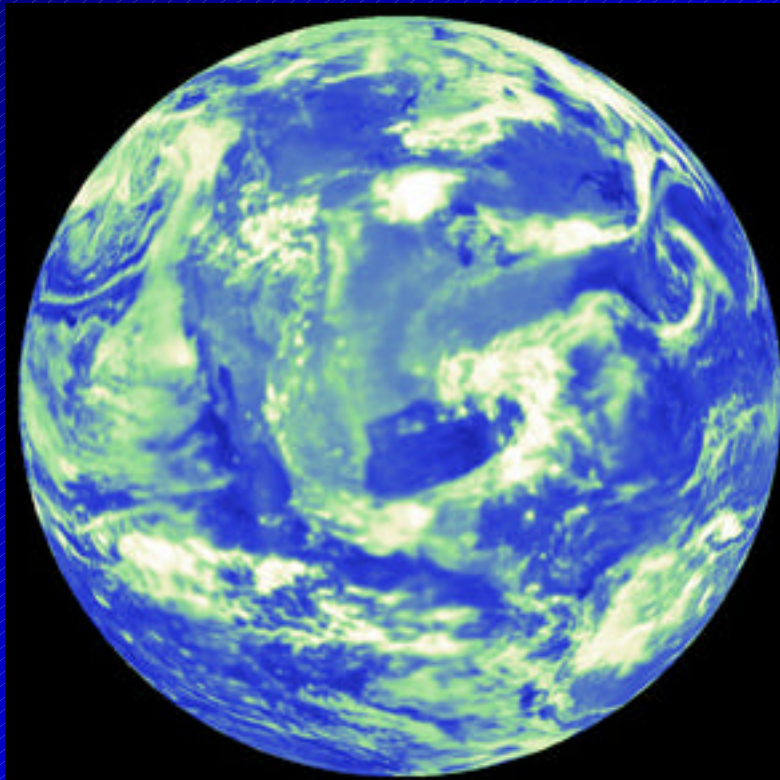
Emitted Longwave Flux, June 22, 2002



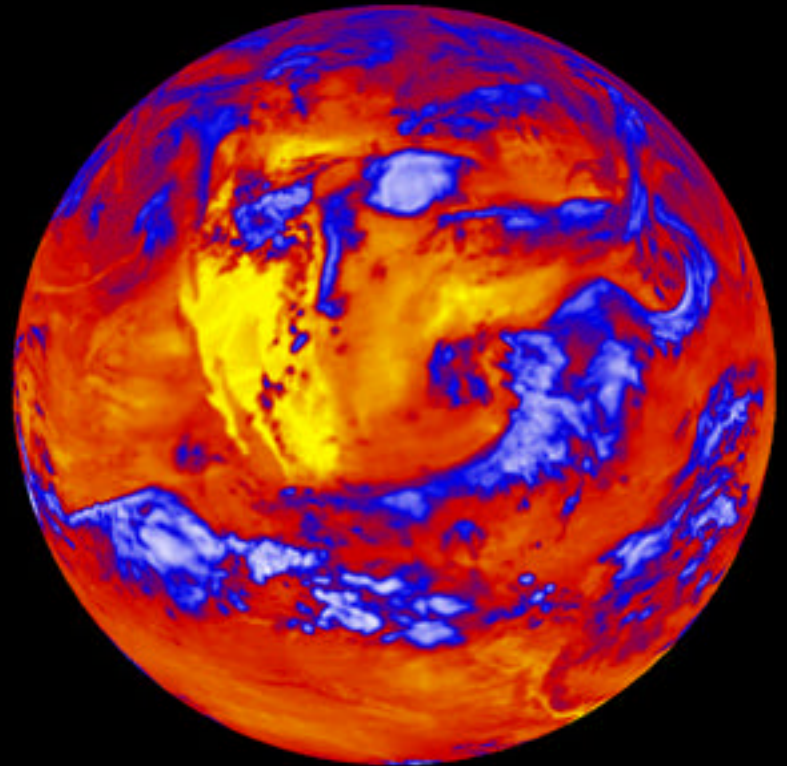
(image courtesy of the CERES Science Team)



CERES Images of Shortwave and Longwave Radiation, June 22, 2002

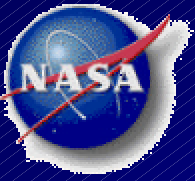


Low High
Shortwave

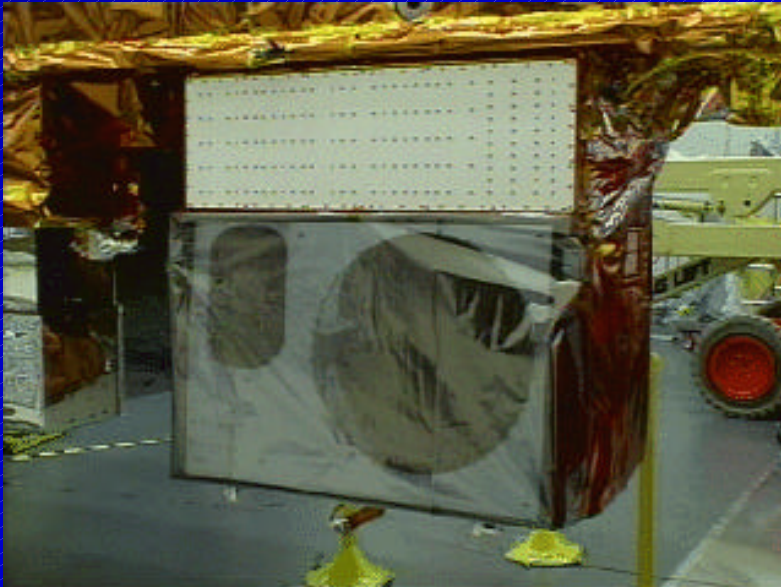


Low High
Longwave

(images courtesy of the CERES Science Team)



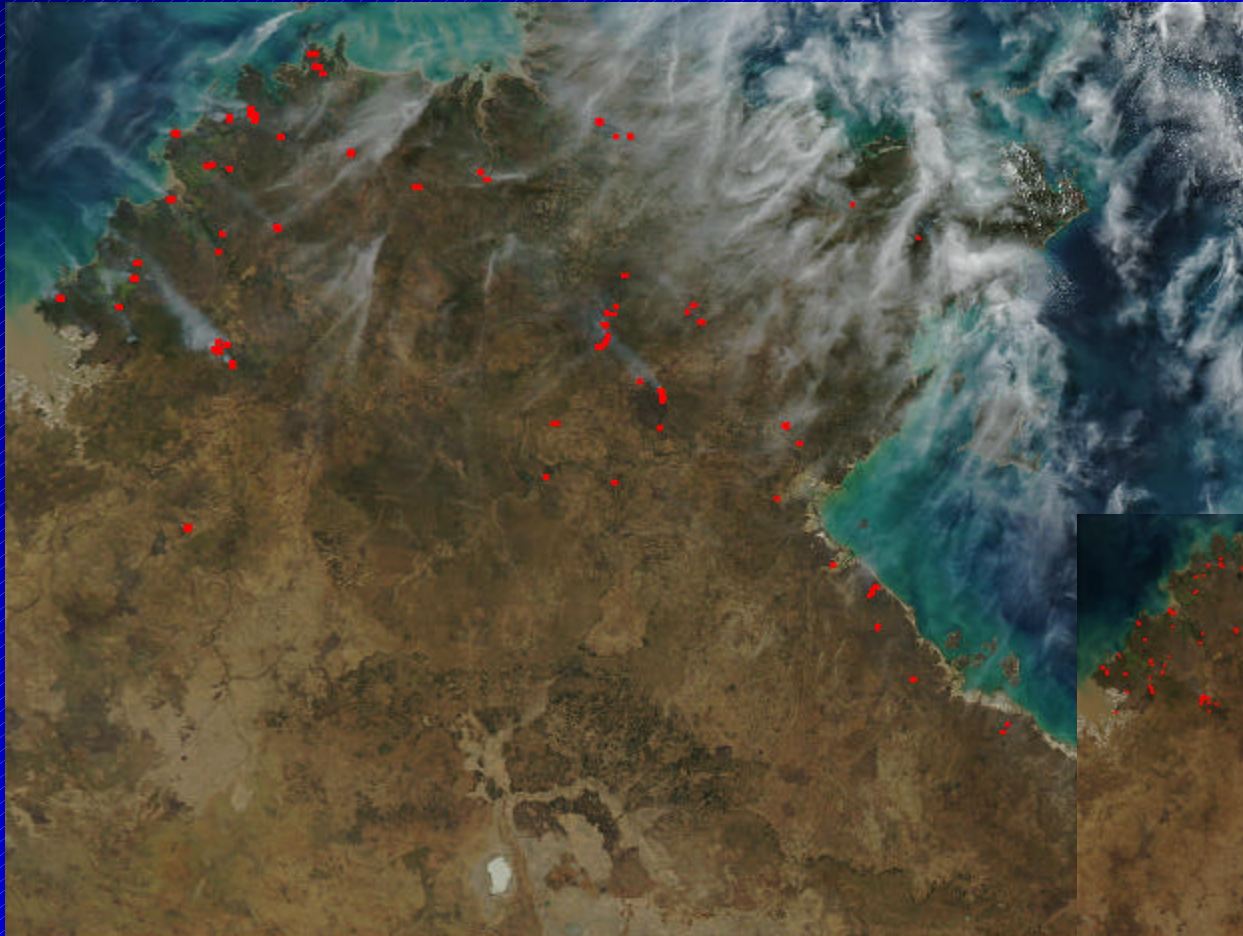
Moderate Resolution Imaging Spectroradiometer (MODIS)



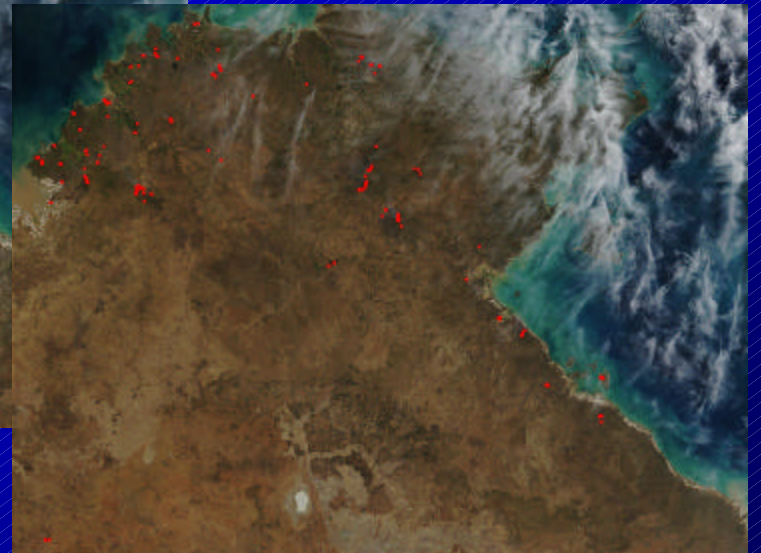
MODIS on Aqua, with the cover removed



MODIS First Light Image of Fires in Australia, June 24, 2002



Aqua first light image

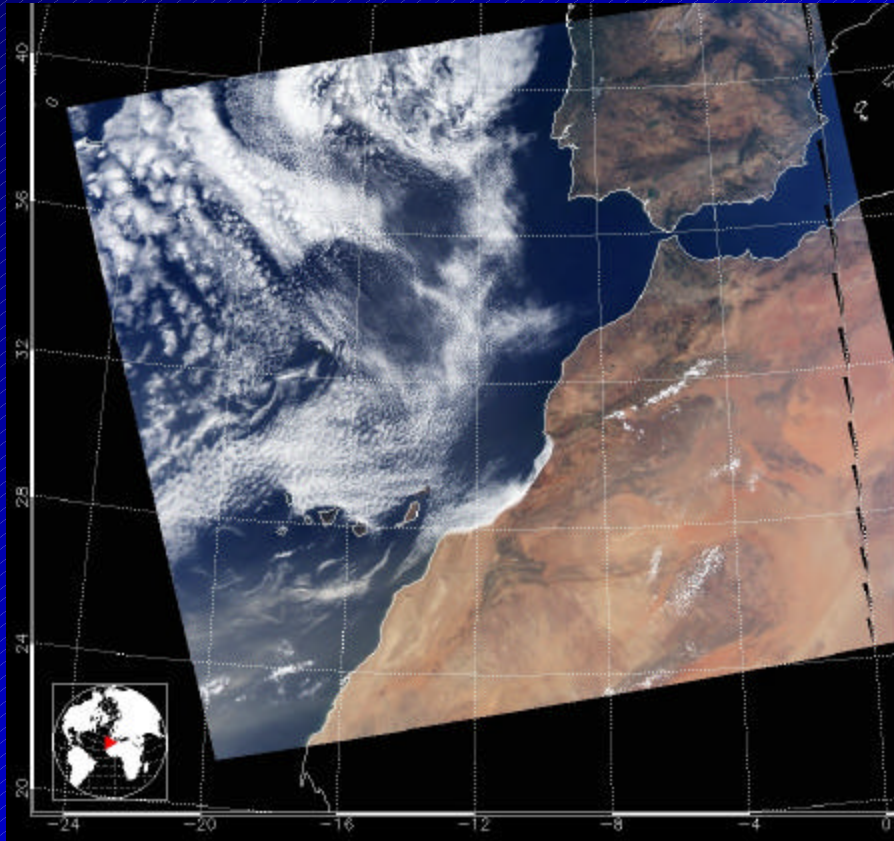


Terra image

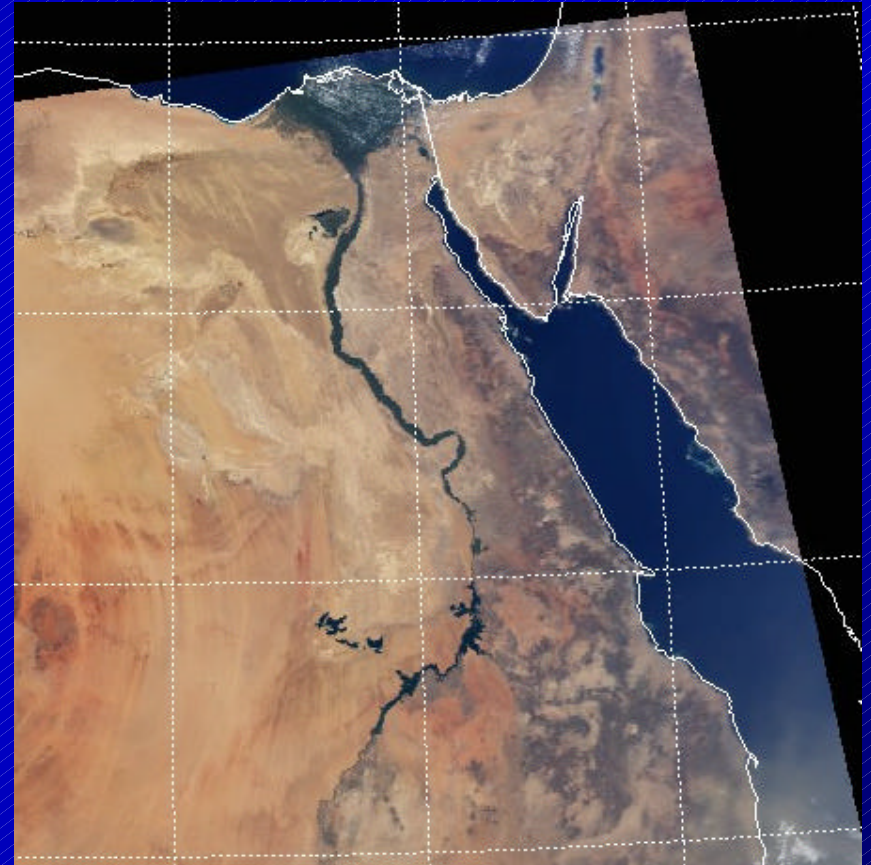
(images courtesy of the MODIS Science Team)



Northern Africa from MODIS



Northwest Africa and vicinity,
7/24/2002



The Nile River and vicinity, 7/23/2002

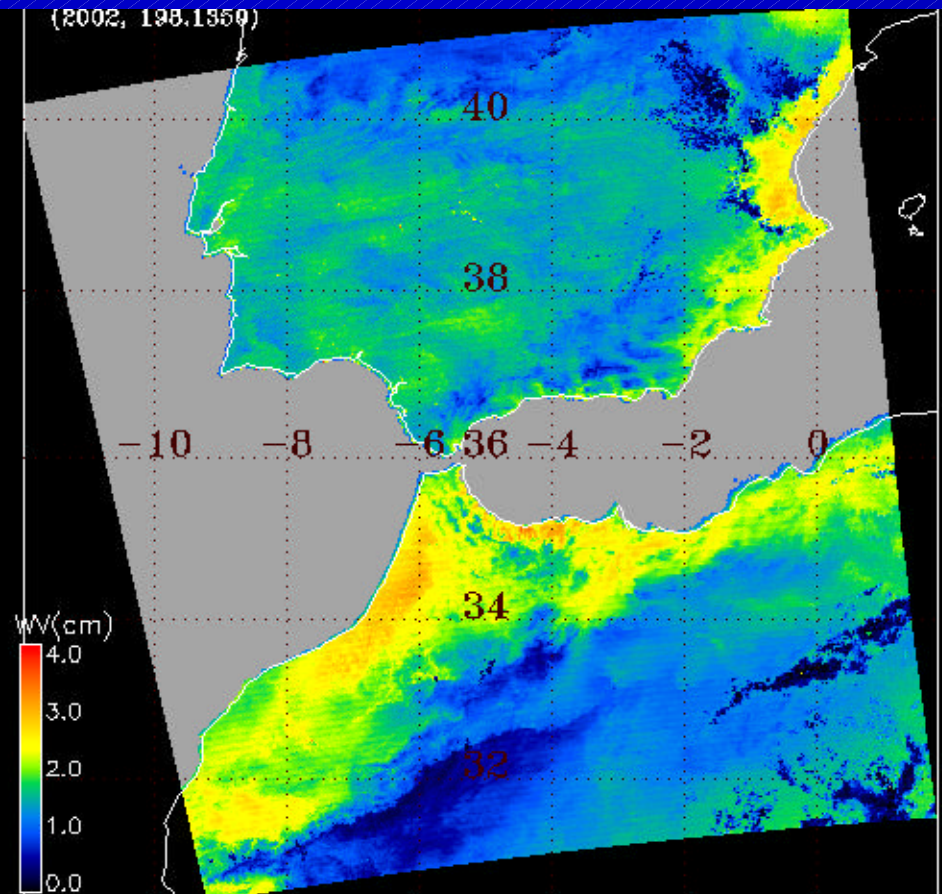
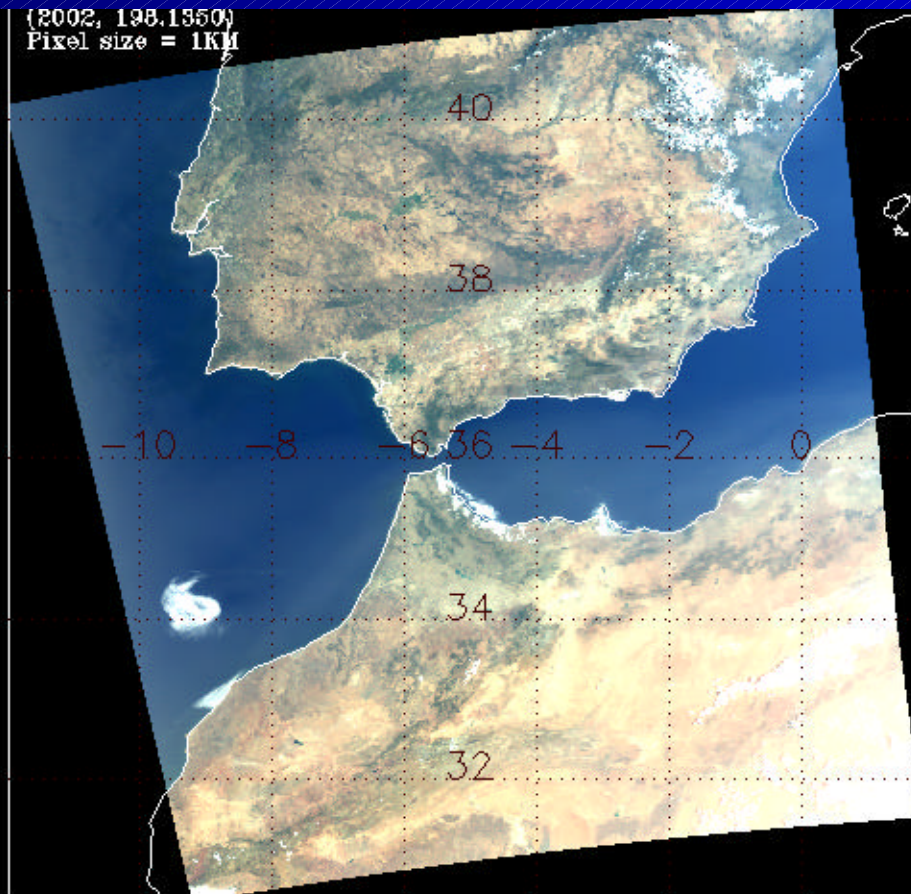
(images courtesy of the MODIS Science Team)



Water Vapor over Spain and North Africa from the Aqua MODIS, July 17, 2002

Color composite from
MODIS visible channels

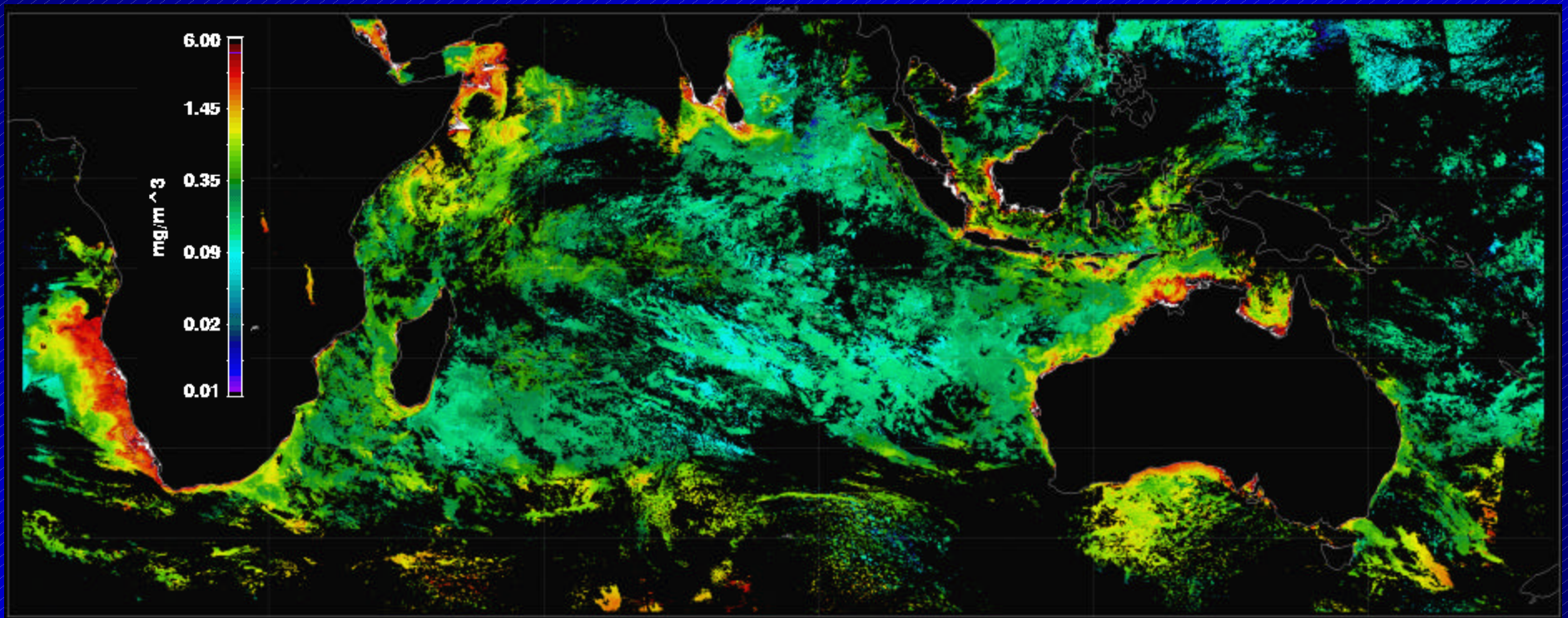
Water Vapor



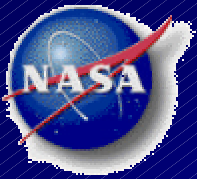
(images courtesy of Bo-Cai Gao and Yoram Kaufman, MODIS Science Team)



MODIS Combined Terra/Aqua Chlorophyll Product for the Indian Ocean, June 25, 2002

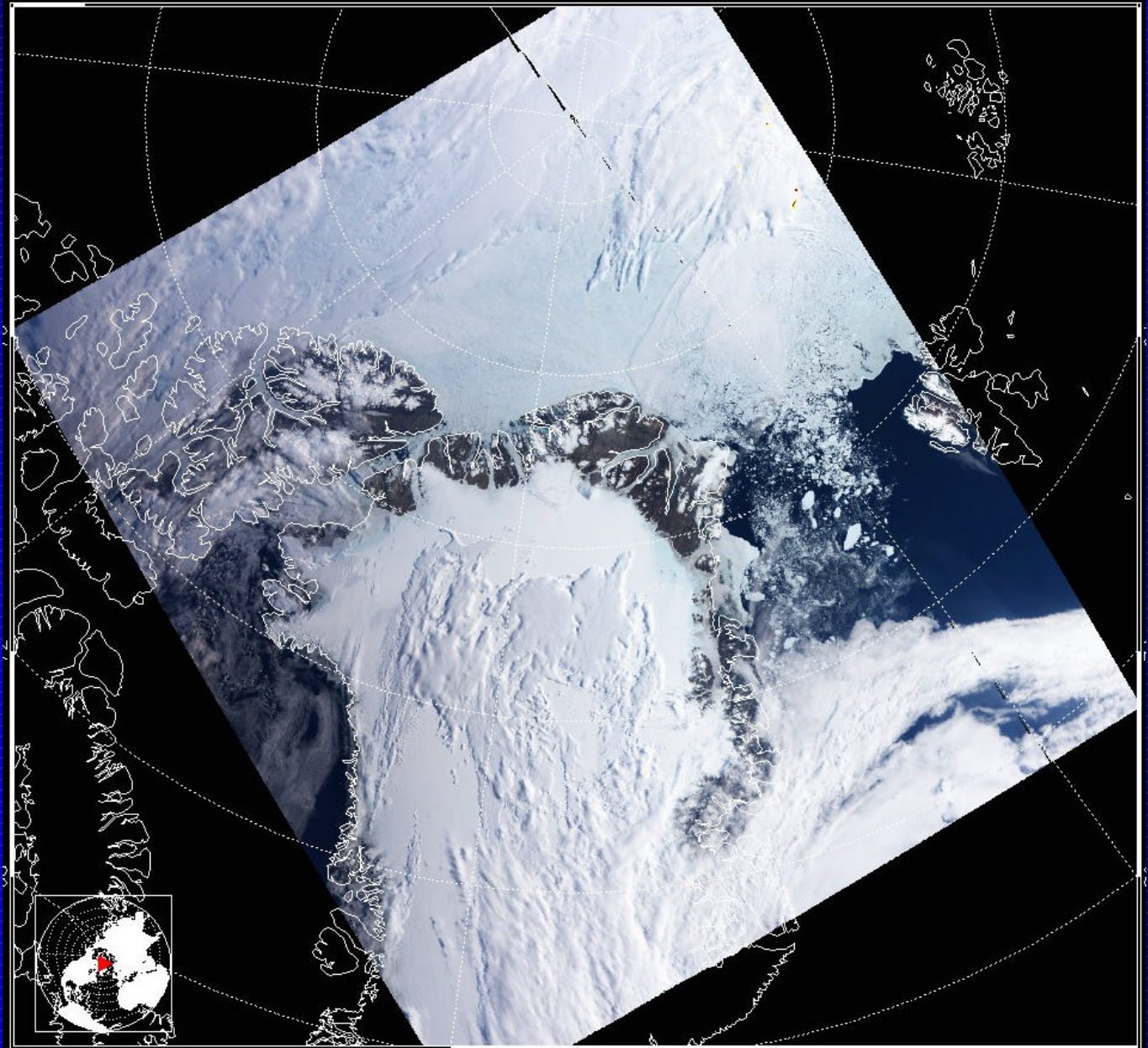


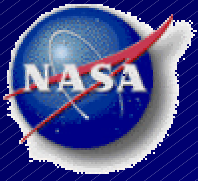
(image courtesy of the MODIS Ocean Group, GSFC, RSMAS)



Arctic Sea Ice and the Greenland Ice Sheet, July 13, 2002, from the Aqua MODIS

(image courtesy of the
MODIS Science Team)





Advanced Microwave Scanning Radiometer for EOS (AMSR-E)

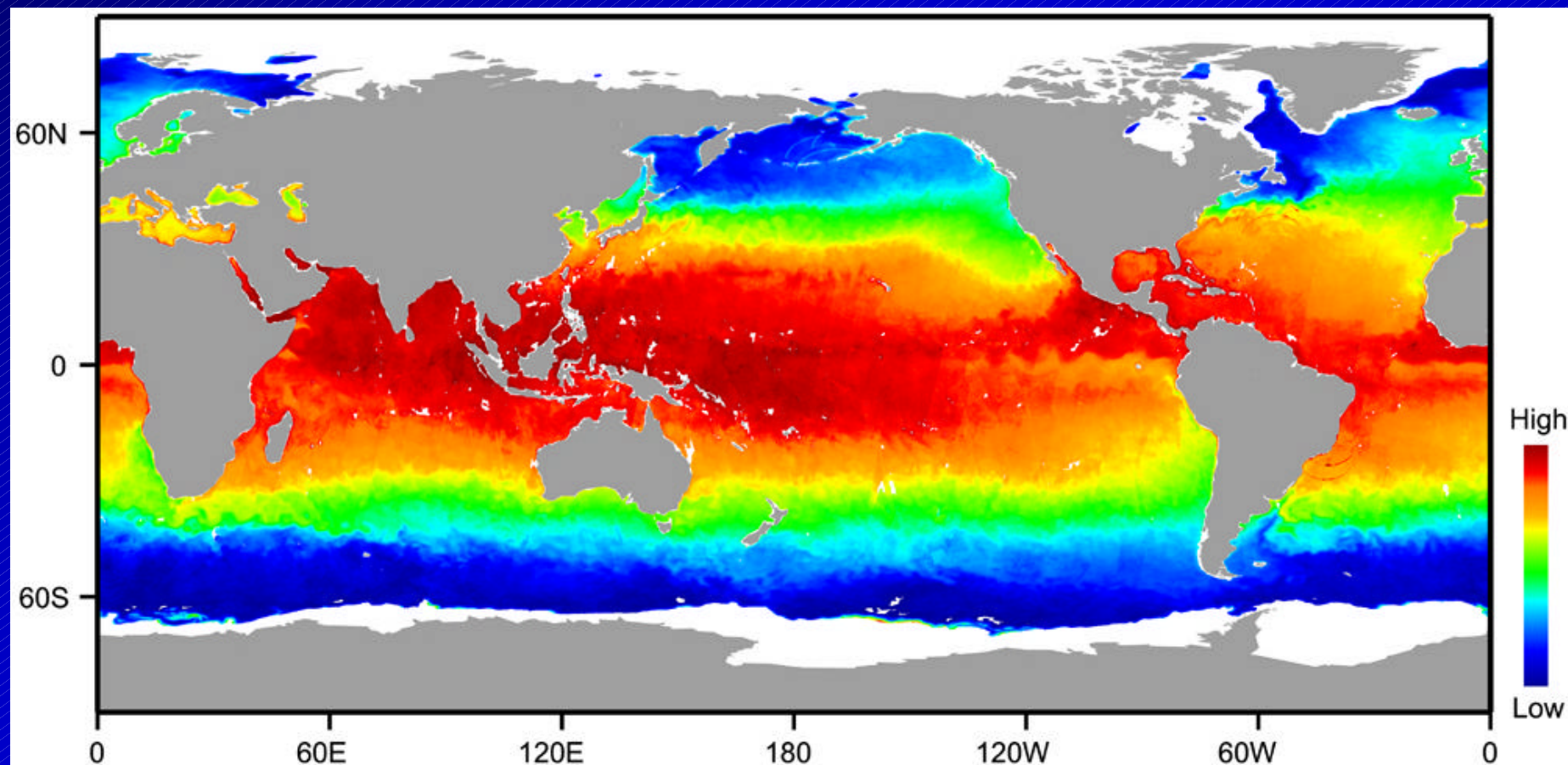
NASDA



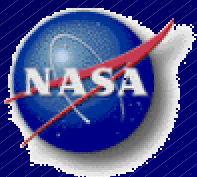


NASDA

Global Sea Surface Temperatures from AMSR-E, June 2-4, 2002



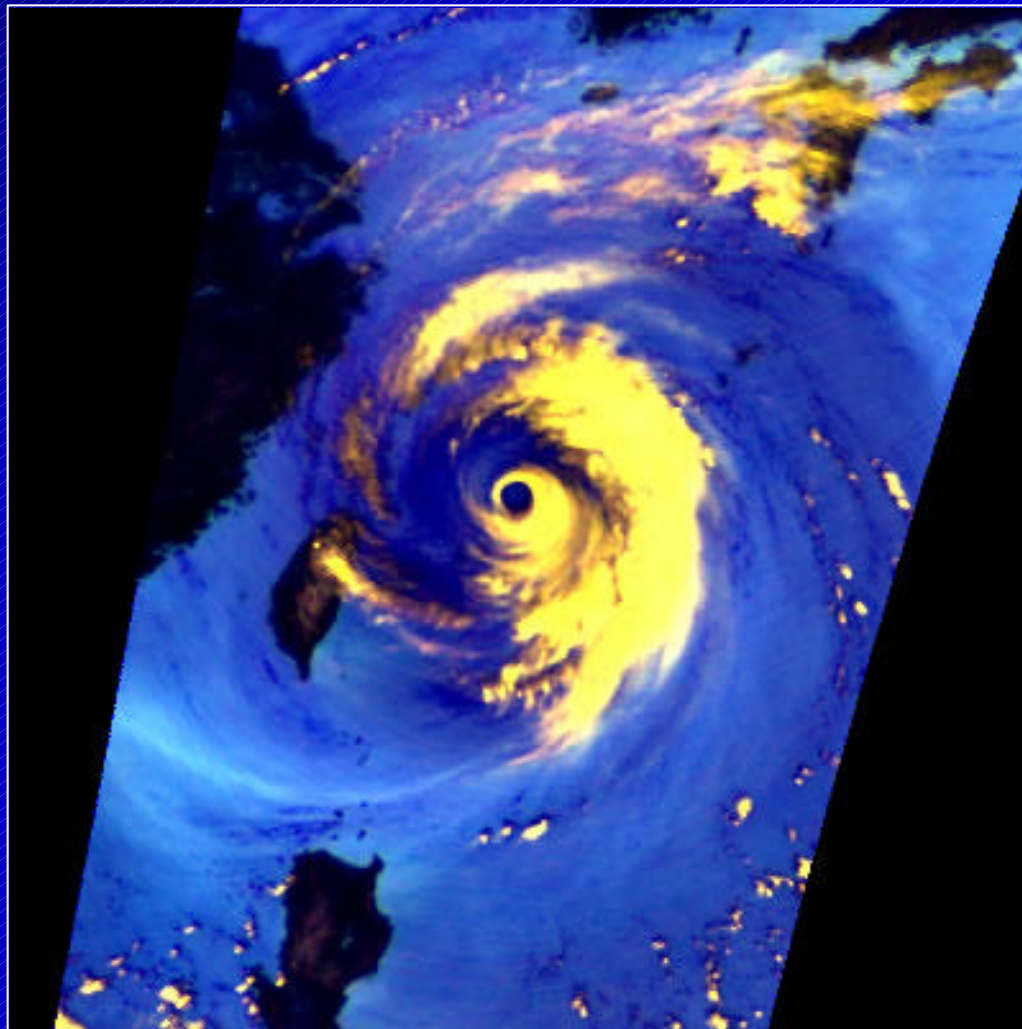
(image courtesy of NASDA)



NASDA

Typhoon in the East China Sea

July 4, 2002, from AMSR-E



AMSR-E image,
2:26 a.m. Japan
Standard Time
(JST).

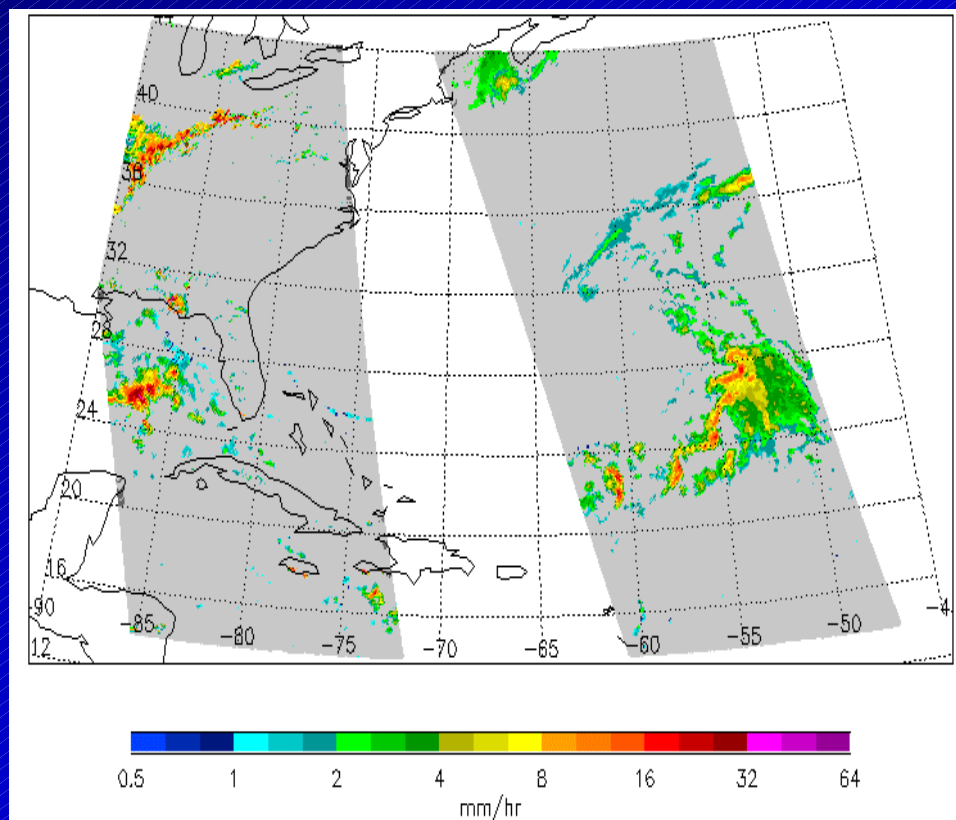
(image courtesy of NASDA)



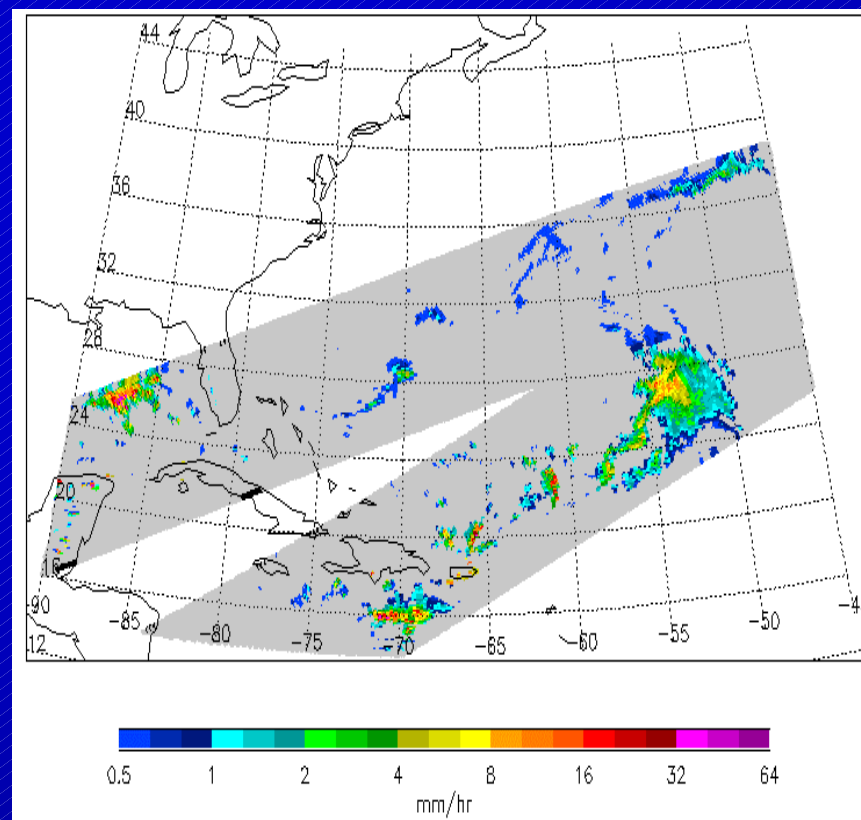
NASDA

Precipitation over the Eastern U.S. and Vicinity, from AMSR-E and the TRMM Microwave Imager (TMI), June 5, 2002

AMSR-E Total Rainfall



TMI Total Rainfall



(images courtesy of Chris Kummerow and Bob Adler)

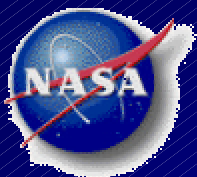


NASDA

Southern Hemisphere Snow Cover from AMSR-E, June 1-5, 2002



(images courtesy of Al Chang, AMSR-E Science Team)

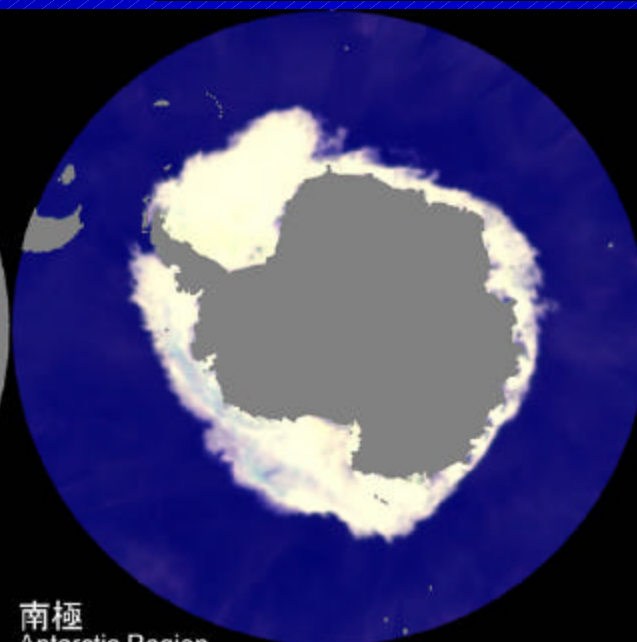


Global Sea Ice
Coverage June
2-4, 2002 (top)
and July 21-22,
2002 (bottom)
from AMSR-E

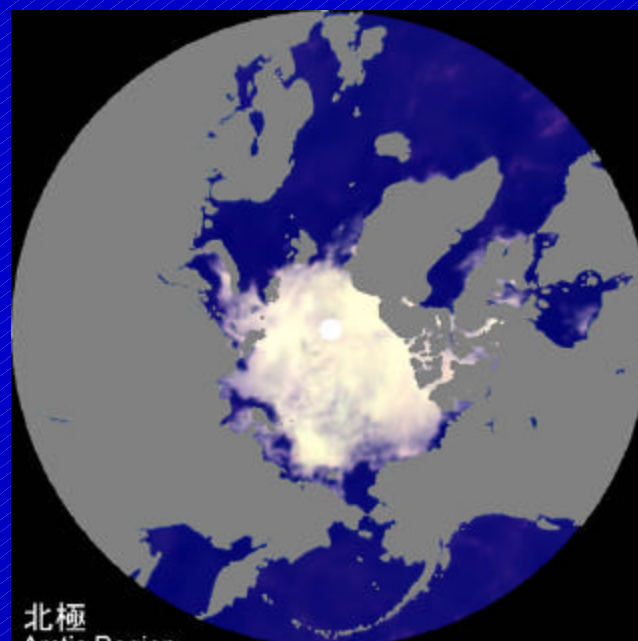
NASDA



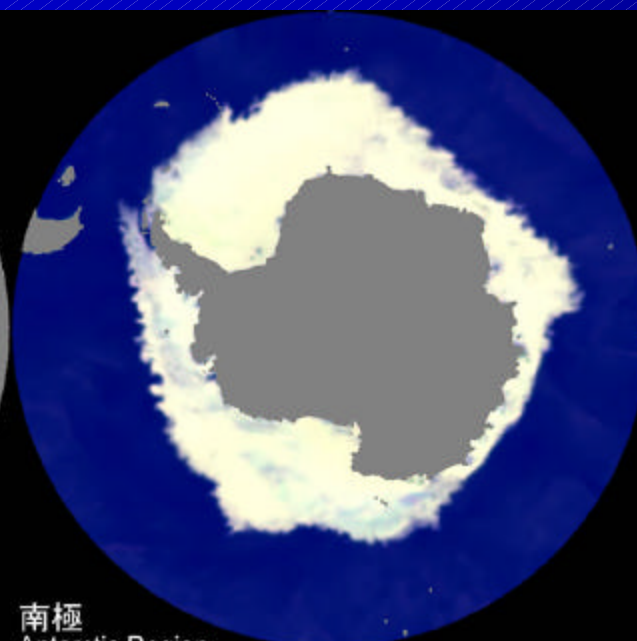
北極
Arctic Region



南極
Antarctic Region



北極
Arctic Region



南極
Antarctic Region

(images courtesy of NASDA)

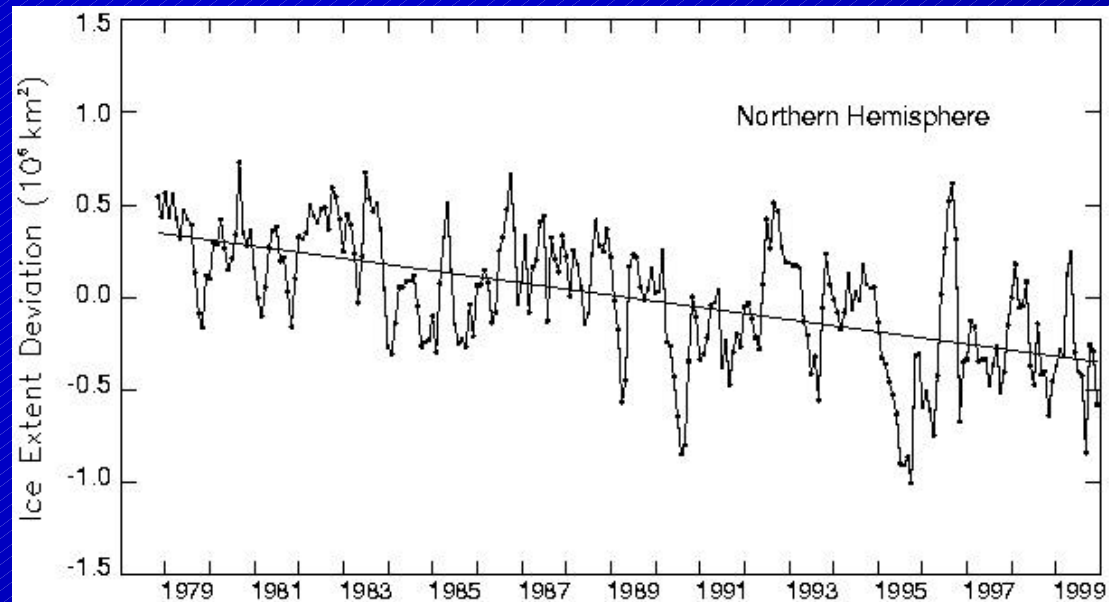
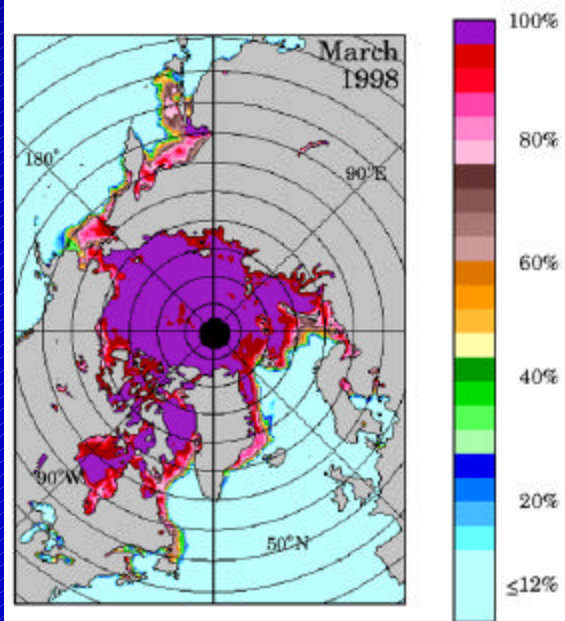


AMSR-E Goals

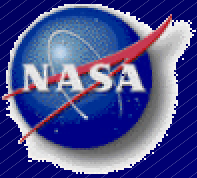
NASDA

- Extend the records of many variables from previous passive-microwave instruments, with improved spatial resolution, and analyze the results.
- Add records of soil moisture and surface temperatures.

Sample record to be extended: a 20+-year satellite record of Arctic sea ice coverage



(extended from Parkinson et al., 1999)



Summary

- Like AIRS, AMSU, and HSB, the other three Earth-observing instruments on Aqua (CERES, MODIS, and AMSR-E) are also sending down high quality data.
- Like the AIRS Team, the CERES, MODIS, and AMSR-E Teams have also generated first light images from their instruments.
- A series of press releases and image advisories based on Aqua data has begun.
 - AMSR-E press release, June 24.
 - CERES image advisory, July 31.
 - AIRS/AMSU/HSB press release, August 6.
 - MODIS press release, August 15.
 - AMSR-E image advisory, August 28.